UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
ENVIRONMENTAL REVIEW
AND ASSESSMENT

May 31, 2016

Ms. Sheila Newman, Chief
Specials Actions Branch
Regulatory Division
U.S. Army Corps of Engineers
P.O. Box 6898
Joint Bases Elmendorf Richardson, Alaska 99506-0898

Dear Ms. Newman,

The U.S. Environmental Protection Agency has reviewed the Draft Environmental Impact Statement for the proposed Donlin Gold Project. Our independent review was conducted in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act, which specifically directs the EPA to review and comment in writing on the environmental impacts associated with all major federal actions. The EPA is serving as a cooperating agency during the NEPA process for this project.

The Donlin Gold Project consists of three components: the mine site, the transportation facilities, and the natural gas pipeline. The major facilities at the mine site include an open-pit hardrock gold mine, a waste rock facility, a tailings dam and storage facility, and a mine ore processing facility. At mine closure, these facilities would be reclaimed and revegetated. Long-term water quality monitoring would be required in perpetuity. Under the proposed action, a new port facility would be constructed on the Kuskokwim River at Jungjuk. The Jungjuk port would be connected to the mine site by a 30-mile long gravel access road. The existing ports at Bethel and Dutch Harbor would require modifications. An airstrip and mine camp would also be constructed. A 315-mile long and 14-inch diameter buried steel pipeline would transport natural gas from Beluga, Alaska, to the power plant at the mine site.

The EPA's review of the DEIS has identified potentially serious impacts to human health and the environment. Therefore, the EPA has assigned an overall rating of EO-2 (Environmental Objections – Insufficient Information) to the Donlin Gold Project DEIS. Our review criteria for rating the DEIS are available on the EPA's website: https://www.epa.gov/nepa/environmental-impact-statement-rating-system-criteria. We have concerns that the proposed project may increase concentrations of mercury and arsenic in surface waters and sediments, which are already elevated under baseline conditions, thereby posing a human health risk to the native communities of the Kuskokwim River region. The DEIS failed to provide the Donlin Health Impact Assessment (HIA) for public review and comment. In addition, we noted inconsistencies among the alternatives and the related environmental analyses that we recommend be addressed in the EIS, particularly regarding subsistence resources and users.

The current information and analysis in the DEIS is not sufficient to fully evaluate the potential adverse impacts to wetlands and aquatic resources. We further note that the DEIS does not identify a preferred alternative. We recommend that the alternatives analysis provide the information necessary to support an evaluation of alternatives under the Clean Water Act §404(b)(1) Guidelines, including information to support identification of the least environmentally damaging practicable alternative (LEDPA).

The Kuskokwim River Watershed, including the tributaries of Crooked Creek, American Creek and Anaconda Creek (KRW), is an important aquatic resource of local, state, and national importance. The KRW is a major resource used for drinking water, transportation, and subsistence and commercial fishing for the native communities. Increased barge traffic on the Kuskokwim River may result in adverse impacts to this resource. We recommend that the EIS identify a preferred alternative that incorporates components of Alternatives 3A (LNG Powered Trucks), 3B (Diesel Pipeline), and 5A (Dry Stack Tailings with liner option) into Alternative 2 (Proposed Action) to avoid and minimize potential adverse impacts to the KRW. This may also represent the environmentally preferable alternative.

It is our understanding that the U.S. Army Corps of Engineers plans to make substantive changes to the wetlands functional assessment methodology and estimates of wetland impacts for the EIS. In addition, the compensatory mitigation plan is conceptual, as information needed to support its development, such as the extent of aquatic resources at the site and their functions, has not yet been finalized. We therefore recommend that the Corps provide complete and accurate information when it is available, and release the revised analysis for public review and comment. In addition, we encourage the Corps to withdraw the current Department of Army Public Notice (PN) issued with the DEIS and issue a supplemental, revised, or corrected PN for review comment and make sure that the new information is captured in the EIS. Doing so will provide the public with an opportunity to review and comment on the new information and analysis, and potential project changes prior to the issuance of a Record of Decision and the CWA §404 permit.

The Health Impact Assessment was not included in the DEIS. We have concerns that the health information and analysis in the DEIS may be inconsistent with the findings of the HIA. We recommend that the draft HIA be distributed for review and comment and public outreach be provided to the local communities regarding the results of the HIA. We recommend that the publicly reviewed and, if necessary, revised HIA be incorporated into the EIS.

As noted above, the Donlin Gold Project may contribute to an increase in existing, mercury and arsenic baseline concentrations, which are naturally elevated in surface waters and sediments. The project may also increase exposure of subsistence foods, drinking water, and air to contaminants from stack emissions and fugitive dust sources. We recommend that the EIS include additional risk-based assessments of potential sources, pathways and routes for human exposure to contaminants, including evaluation of acceptable limits for human health. We recommend that the cumulative effects analysis evaluate cumulative impacts to human health from exposure to past, present, and reasonably foreseeable future actions. We encourage the project proponent to partner with the State of Alaska and the local communities to implement long-term biological monitoring programs for human health and subsistence foods throughout the active mine life and post closure.

During mine operations, the dewatering of the open pit mine using groundwater wells would lower the water table resulting in a reduction and/or elimination of surface and groundwater inputs to Crooked Creek and adjacent wetlands. We have concerns regarding impacts to fish rearing, migration, and spawning habitat, as well as to eggs incubating in the gravel. To augment the reduction and/or elimination of surface water flows, we recommend that the EIS evaluate the advanced water treatment of the groundwater and the discharge of the treated water into Crooked Creek further downstream from the influences of the mine pit dewatering wells.

We recommend that the FEIS include discussion clarifying whether and how a premature mine closure would affect financial assurance for closure and reclamation and payments to establish the Donlin Gold

Trust Fund for long-term monitoring. It is our understanding that models have been used to evaluate the financial assurance estimates during different timeframes of the active mine life. A figure outlining funding throughout mine life and closure should be included in the EIS.

The continued integrity of the tailings storage facility and dam are dependent on the design, construction, monitoring and maintenance. Adhering to an adaptive management plan based on a Failure Modes Effects Analysis (FMEA) is an effective manner to prevent a breach, and minimize the occurrence of events like the failure at the Mount Polley Mine in central British Columbia, resulting in a catastrophic release of tailings slurry/saturated tailings into the watershed. We note that a FMEA was developed during the DEIS process and we recommend that the FMEA process continue to be used to inform the engineering design and mitigation processes as the project continues through the active mine life and post-closure.

The EPA participated in the DEIS public meetings in Crooked Creek, Akiak, Aniak, Bethel, and Anchorage. We consistently heard concerns regarding potential spill risks, contamination of subsistence foods, and changes to the traditional subsistence way of life as a result of the proposed Donlin Gold Project. We encourage the project proponent to continually engage and actively work with the native communities of the Kuskokwim River region on developing regional spill response plans, including training and exercises, and monitoring potential contaminants in water and sediments, and subsistence foods, to maintain healthy individuals and strong communities.

Finally, we note the valuable inclusion of financial assurance information in the DEIS. This information is an important component of the analysis and public disclosure, consistent with the intent of NEPA.

The EPA's detailed comments regarding our concerns on the Donlin Gold Project DEIS are enclosed (Enclosure 1).

Thank you for the opportunity to review and provide comments on the Donlin Gold Project DEIS. As a cooperating agency, the EPA looks forward to working with the Corps to address the issues and concerns we have identified in this letter. If you have any questions regarding our comments, please do not hesitate to contact me at (206) 553-2581 or feel free to contact Mark Jen of my staff in the Alaska Operations Office in Anchorage at (907) 271-3411. We appreciate your continued coordination and involvement in advancing this important resource development project for Alaska.

Sincerely,

R. David Allnutt, Director
Office of Environmental Review and Assessment

Enclosure

ENCLOSURE 1
U.S. ENVIRONMENTAL PROTECTION AGENCY
DETAILED COMMENTS ON THE DONLIN GOLD PROJECT DRAFT EIS
(EPA NO. 12-0057-COE)

ALTERNATIVES ANALYSIS

During the public meetings, we heard comments regarding concerns about impacts from increased barge traffic on the Kuskokwim River, potential spills, contamination of subsistence resources, and changes to the traditional subsistence way of life. We recommend a re-evaluation of the alternatives analysis in order to identify a preferred alternative that will be environmentally protective to support identification of the least environmentally damaging practicable alternative (LEDPA) as required under the Clean Water Act (CWA) §404(b)(1) Guidelines.

Alternative 2 (Proposed Action)

We have concerns that the Waste Rock Facility (WRF) and the contact water ponds may be potential sources of groundwater contamination. We recommend that Alternative 2 include consideration of a synthetic impermeable liner for the WRF and the contact water ponds, particularly the lower contact water pond. For a balanced and consistent alternatives analysis, we recommend that the EIS evaluate two options for the WRF and contact water ponds, one with a liner and one without.

The mine pit dewatering of groundwater would reduce and/or eliminate surface and groundwater flows from Crooked Creek and the adjacent wetlands. In particular, during the winter months, surface water flows within certain reaches of Crooked Creek could be eliminated. We recommend that the EIS evaluate design features, mitigation measures, and best management practices (BMPs) to replenish the water flows in Crooked Creek. For example, the EIS could evaluate the option of advanced water treatment of the groundwater pumped from the mine pit dewatering activities, and discharge of the treated water further downstream in Crooked Creek beyond the influence of the cone of depression.

In the DEIS, the source of natural gas for the proposed pipeline was considered, but eliminated from further analysis. We recommend that the EIS evaluate the types of facilities that would be needed to handle and/or store the natural gas prior to transportation to the mine site and the associated direct, indirect, and cumulative environmental impacts. For example, if the source of natural gas is from Cook Inlet, then the existing natural gas infrastructure in southcentral Alaska could accommodate the natural gas. However, if the source of natural gas is from shipments of liquefied natural gas (LNG) from the Pacific Northwest (United States), Canada, and/or abroad, we recommend the EIS evaluate the proposed facilities that would be needed to accommodate the LNG handling and storage. Port MacKenzie, in the upper Cook Inlet, may be a viable LNG handling and storage facility. An LNG plant is proposed for Port Mackenzie, which is accessible to the existing natural gas pipeline infrastructure. In Alternative 3B, the DEIS identified several sources of diesel fuel for the proposed diesel pipeline, either transported by ocean vessels from the Pacific Northwest to the Tyonek North Foreland Dock, or from the Tesoro Refinery in Nikiski, Alaska. For a balanced and consistent analysis, we recommend that the EIS identify the source of natural gas for the pipeline under Alternative 2 (Proposed Action), and the infrastructure needed for its transportation, handling, and storage. We recommend that the environmental impacts associated with these facilities be evaluated in the EIS.

Alternative 3A (Reduced Diesel Barging: LNG-Powered Haul Trucks)
According to the DEIS, large trucks account for 75 percent of the total annual diesel consumption for the project. Alternative 3A would decrease the peak annual diesel consumption by 69 percent. The total peak barge traffic would be reduced by 32 percent during operations. Instead of diesel fuel, LNG would be used to power the large 300-ton trucks that would transport waste rock and ore from the open pit. An LNG facility would be constructed on site. We understand that LNG-powered haul trucks may not be commercially available at this time, but the technology to use natural gas is proven and companies are developing the technology. We recommend that Alternative 3A evaluate the use of LNG and/or natural gas for all trucks, including the trucks hauling cargo and fuel on the mine access road from the Jungjuk Port. In addition, we recommend that the EIS evaluate the opportunity for other aboveground facilities at the mine site to be powered by LNG and/or natural gas.

Alternative 3B (Reduced Diesel Barging: Diesel Pipeline)
The DEIS indicates that during operations, diesel barge traffic would be reduced by 48 percent, from 122 round trips to 64 round trips per year. Diesel fuel would be delivered to the Tyonek North Foreland Facility on the west side of Cook Inlet, and an additional 19-mile diesel pipeline segment would connect to the pipeline at Beluga. We recommend that Alternative 3B evaluate options for diesel fuel delivery that would eliminate impacts to the Native Village of Tyonek, and modifications to the North Foreland Dock Facility. For example, fuel delivery could include evaluation of Port MacKenzie on the west side of Knik Arm, and connection of a diesel pipeline to Beluga using Horizontal Directional Drilling (HDD) below the Susitna River. In addition, the DEIS indicates that diesel fuel could be obtained from the Tesoro Refinery in Nikiski on the Kenai Peninsula (east side of Cook Inlet). We recommend that Alternative 3B evaluate a subsea pipeline in Cook Inlet from Nikiski to Beluga.

Alternative 5A (Dry Stack Tailings)
The DEIS indicates that dry stack tailings could remove up to 80 percent moisture from the mine tailings to create dry pastes. The Pogo Mine in Alaska incorporates the use of dry stack tailings as part of the operations for mine tailings disposal. We understand that the projected volumes of mine tailings generated at the Donlin Gold Mine is on a larger scale than at the Pogo Mine. We recommend the EIS evaluate options of incorporating both types of mine tailings disposal methods: dry stack tailings and subaqueous tailings (Alternative 2). The dry stack tailings disposal method could be implemented during summer seasons to address concerns about effects of freezing conditions in the winter. The goal of implementing both methods would be to remove the majority of water from entering the tailings storage facility, and to minimize the potential contamination from mine tailings resulting from an accidental breach in the tailing storage facility (TSF) dam and/or rupture of the liner.

Environmentally Preferable Alternative
The DEIS identifies neither a preferred alternative nor an environmentally preferable alternative. We offer our recommendations for an environmentally preferable alternative that would address concerns regarding impacts to the native Alaska traditional subsistence way of life on the Kuskokwim River. Environmental impacts could be avoided and minimized by reducing diesel barging, barge stranding, wakes, bed scour, shoreline erosion, spill risks, and contamination to subsistence resources.

The EPA's recommendation for the environmentally preferable alternative includes a combination of components, sub-components, and options from Alternative 2, 3A, 3B, and 5A. Due to concerns about

potential groundwater migration and leaching of contaminants from the WRF and the lower contact water pond, we recommend that the environmentally preferable alternative include a synthetic impermeable liner for the WRF and the contact water ponds at the mine site. From Alternative 3A, the environmentally preferable alternative would use LNG or natural gas, rather than diesel, to power all trucks, vehicles, and certain facilities at the mine site. The environmentally preferable alternative would include both a natural gas pipeline (Alternative 2) and diesel fuel pipeline (Alternative 3B) within the same right-of-way, and identify the sources of natural gas and diesel fuel so that the direct, indirect, and cumulative environmental impacts could be adequately evaluated for the necessary transportation, handling, and storage facilities. The environmentally preferable alternative would manage and store mine waste tailings using both a subaqueous disposal and dry stack tailings method (Alternative 5A). Dry stack tailings could be implemented during the summer months, and the subaqueous disposal method in the colder winter season.

ENVIRONMENTAL ANALYSIS - APPROACH AND METHODOLOGY

The DEIS (Chapter 3) combines the description of the baseline environmental conditions (Affected Environment) and the analysis of environmental effects (Environmental Consequences) for each resource. The direct and indirect effects for each resource or resource use were analyzed on the basis of the factors of intensity (magnitude), duration, extent, and context of the impact (40 CFR 1508.27).

The summary impact rating thresholds are generally qualitative, but quantitative when available. These thresholds include no effect, negligible, minor, moderate, and major. We recommend providing rationale for a given determination to provide further transparency and better inform decision makers and the public as to the importance of practicable mitigation of adverse effects, particularly where they are moderate or minor. We also think there are instances where providing a rationale will sharpen how a threshold is applied. For example, when scientifically established quantitative thresholds are available, such as state water and air quality standards, it may not be appropriate to characterize an impact as "minor to moderate" when the project may exacerbate exceedances of state and/or national standards. For example, arsenic and mercury concentrations in Crooked Creek and the Kuskokwim River both exceed the Alaska Water Quality Standards. The DEIS concludes that the environmental impacts from arsenic and mercury are "minor to moderate." We recommend that the EIS consider revising these rating thresholds and discuss design features, such as advanced water treatment, and other mitigation measures that could reduce impacts from substances such as arsenic and mercury.

As currently written in the DEIS, it is not clear which effects categories will be addressed with measures to reduce impacts or whether design features are already incorporated into the ratings. For example, most of the summary ratings for construction, operations and maintenance, and reclamation and closure of the Donlin Gold Project are "minor to moderate." We recommend that the EIS clarify which levels of summary impact ratings will be addressed with measures to reduce impacts and whether design features, mitigation measures, and BMPs are already factored into the ratings.

The DEIS environmental effects analysis indicates that impacts to subsistence resources and uses are "minor to moderate." These summary ratings are inconsistent with the Bureau of Land Management's (BLM) preliminary findings under the Alaska National Interest Land Conservation Act (ANILCA) Section 810 (Appendix N), which identified significant restrictions to subsistence users and resources affecting native subsistence communities living near the mine site, along the Kuskokwim River, and adjacent to the pipeline right-of-way for all of the action alternatives, including the proposed action. We recommend that the EIS resolve these inconsistencies.

HEALTH IMPACT ASSESSMENT

The Alaska Department of Health and Social Services (ADHSS) is developing a Health Impact Assessment (HIA) for the Donlin Gold Project. According to the DEIS, the HIA is still under development. We have concerns that the health information and analysis in the DEIS may be inconsistent with the findings of the HIA. We recommend that the EIS identify mitigating measures to minimize adverse health impacts and disclose how reporting and evaluation of the HIA will be completed. We recommend that the draft HIA be distributed for review and comment and that public outreach be provided to the local communities regarding the results of the HIA. We recommend that the publicly reviewed and, if necessary, revised HIA be incorporated into the EIS.

Fish Consumption Advisories

For the middle-Kuskokwim River area, the ADHSS has issued fish consumption advisories for mercury in burbot and pike. The DEIS indicates that mercury concentrations in fish tissue could be up to three percent greater than current levels, and would be associated with an increase in mercury from fugitive dust and stack emission sources from the Donlin Gold Project. We have concerns that the actual mercury concentrations in fish tissue may be greater than the modelling results would suggest. We recommend that the EIS include a human health risk assessment for mercury to determine whether the estimated percent increase in fish tissue concentrations is within acceptable limits for human exposure and consumption. We recommend that the EIS disclose the limits for human consumption and exposure to mercury and that screening levels or thresholds be established to determine whether or not further monitoring would be required after adaptive management. Furthermore, we recommend long-term monitoring and fish tissue testing for mercury in the middle-Kuskokwim River area throughout the active mine life. We recommend that the EIS include a commitment for the project proponent to partner with the State of Alaska and the local communities to develop and implement a subsistence fish biological monitoring program and mercury biomonitoring for other sources of subsistence foods (e.g., birds, eggs, berries, and wildlife).

Mercury Biological Monitoring Program

Since 2002, the ADHSS has implemented a statewide hair mercury bio-monitoring program to collect information about mercury exposures among women of childbearing age. We encourage the project proponent to partner with the State of Alaska and the local communities to continue the bio-monitoring program throughout the active mine life. We recommend that the hair mercury bio-monitoring program be expanded to include infants, young children, and the elderly. We also recommend that the EIS include a commitment by the project proponent to support additional mercury bio-monitoring efforts in communities along the middle-Kuskokwim River region with active engagement and involvement from the native communities. We recommend establishing screening levels or thresholds based on the EPA reference dose for mercury in order to determine whether or not further monitoring would be required after adaptive management.

We encourage the project proponent to continue the partnership with the State of Alaska on the Donlin Gold Project HIA. We recommend that the HIA be reevaluated every five to ten years during the active mine life and post closure to include new data, information, research and studies regarding the health of the native communities in the middle-Kuskokwim River region. As part of their corporate responsibility, we recommend that the project proponent actively engage and work with the local communities to

monitor, sample, and test subsistence foods for mercury and other contaminants to ensure protection of human health.

SUBSISTENCE RESOURCES AND USERS

The Bureau of Land Management's (BLM's) Preliminary ANILCA §810 Analysis of Subsistence Impacts (Appendix N) indicates significant restrictions to subsistence users and resources for the proposed action and the action alternatives. The native communities of Crooked Creek and Napaimute would be affected due to their close proximity to the mine site. Impacts from increased fuel and cargo barging traffic and potential spill risks from a river barge release of diesel fuel, and spills of cyanide, mercury, and mine tailings would affect all native communities living along the Kuskokwim River. The Farewell airstrip proposed for the pipeline construction and operations would increase access to non-local hunters who may compete with the local subsistence communities of McGrath, Nikolai, and Tokotna.

We have concerns that the DEIS environmental analysis under NEPA and BLM's preliminary subsistence findings under ANILCA §810 are not consistent. According to the BLM, the ANILCA §810 findings were based on the information and analysis in the DEIS. As stated previously, we recommend that the environmental analysis and the summary impact ratings for subsistence be reevaluated in the EIS to ensure consistency with agency findings and the EIS resolve the inconsistencies between the subsistence summary conclusions in DEIS and BLM's ANILCA §810 findings.

To address the issues regarding potential restrictions to subsistence users and resources, we recommend that the EIS evaluate different alternatives, modify the proposed action, and/or incorporate additional design features, mitigation measures, and BMPs. For example, in order to reduce the potential spill risks and impacts from increased river barging on the Kuskokwim River, we recommend incorporating components and subcomponents of Alternatives 3A and 3B into the preferred alternative for the EIS. Both alternatives would reduce the number and frequency of fuel barges on the Kuskokwim River during operations.

In addition, we recommend eliminating the use of the proposed airstrip at Farewell, which may increase access to non-local hunters and result in more competition of subsistence resources to the local community. We recommend that the EIS consider other locations for the airstrip, further away from subsistence communities, to access the pipeline ROW and/or evaluate additional gravel access roads and/or ice roads.

We recommend that the EIS analyze additional mitigation measures to minimize impacts to subsistence resources and users. We recommend that the EIS include a commitment by the project proponent to work actively and engage the local communities on opportunities to improve access to subsistence resources during the active life of the mine. For example, a local subsistence board could serve to advise the project proponent of potential conflicts with access to subsistence uses and recommend improvements to mine operations that would avoid and minimize subsistence conflicts.

We also recommend that the EIS include a commitment to develop a Subsistence Users and Resource Plan, which would include best management practices for the mine operations to improve subsistence activities and avoid potential conflicts. We recommend that the plan also include monitoring of mine

activities to ensure that subsistence resources are adequately protected throughout the active mine life and post-closure. We recommend that a Subsistence Report be developed with input from the local subsistence users and that the report includes an adaptive management framework that will use and revise monitoring information and activities as appropriate. We recommend that the report be presented to the subsistence communities for review and comment. Active involvement of the local communities is important to support regional planning and implementation for the prevention, monitoring, and response to accidental spills of fuel, cyanide, mercury, and mine tailings to protect subsistence resources.

THE KUSKOKWIM RIVER WATERSHED

The Kuskokwim River watershed, including Crooked Creek, is an important aquatic resource of local, regional, state, and national importance. The Kuskokwim River originates at the headwaters of the Alaska Range and drains into the Bering Sea. Extending for 724 miles, it is the second largest river in Alaska. It is the ninth largest river in the United States by average discharge and seventeenth largest by basin drainage area.

The Kuskokwim River represents a major lifeline for the Alaska native communities in southwest Alaska who rely on its water for drinking, cooking and cleaning, subsistence fishing and cultural uses, recreation, and transportation. The Kuskokwim River is a significant salmon fishery, which provides essential fish habitat for all five species of Pacific salmon. The Alaska Department of Fish and Game (ADFG) considers the Kuskokwim River one of the largest subsistence fisheries in Alaska with more than 1,500 households currently fishing. Approximately 38 communities live within the Kuskokwim River drainage, which represents 4,600 households. There is also a major commercial salmon fishery on the Kuskokwim River.

During the public meetings, we heard from individuals and communities regarding project impacts to the Kuskokwim River and their traditional subsistence way of life. The increase in diesel and cargo barge traffic during the active mine life would result in additional boat wakes, shoreline erosion, bed scour, impacts to fish habitat, and accidental spills. We recommend that stream bank restoration along the Kuskokwim River and Crooked Creek be evaluated as compensatory mitigation under CWA §404(b)(1) guidelines.

Baseline Conditions

The Kuskokwim River is approximately ten miles downstream from the proposed mine site at the confluence of Crooked Creek. The DEIS includes baseline concentrations of total mercury in surface water and sediments; however, there is limited information regarding baseline concentrations of methylmercury, a more bioavailable and potentially harmful form of mercury. We recommend the EIS include additional baseline surface water and sediment concentrations for methylmercury in Crooked Creek and the Kuskokwim River. In addition, we recommend that the baseline water and sediment concentrations for Crooked Creek and the Kuskokwim River be compared to baseline concentrations for other major river systems in Alaska, both in mineralized and non-mineralized areas. This information would serve as a baseline comparison for the differences and/or similarities, in addition to the comparison with state and national standards. We recommend that the EIS discuss the implications of the baseline concentrations.

We recommend that the EIS include a commitment by the project proponent to actively engage and work directly with the local communities along the Kuskokwim River to develop and implement a long-term water and sediment sampling, testing, and monitoring plan. We recommend that the actual measured concentrations during mine construction, operations, and post closure be compared to baseline concentrations and that screening levels be established to determine whether or not further testing would be required through adaptive management. We recommend that annual reports of the water and sediment concentrations be developed and presented to the communities for review.

Shoreline Erosion

The DEIS indicates that project related barge traffic is estimated to increase the Kuskokwim River shoreline erosion by 0.01 to 0.21 acres per mile per year (upstream to downstream) associated with the increase in wave energy generated by the barge tows. An analysis of wave energy produced by a projected 173 barge trips per year (102 fuel and 71 cargo barge train trips) indicated that barges impart the greatest wave energy on the downstream return trip when they are unloaded and travel at higher speeds. Wake energies generated by fuel barge trains traveling upstream were 150 to 400 percent greater than cargo barge trains and varied with the section of the river.

In order to minimize shoreline erosion of the Kuskokwim River from increased barge traffic during operations, we recommend incorporating Alternatives 3A and 3B into the preferred alternative. Alternative 3A would reduce river fuel barge traffic from 122 to 83 roundtrips, which would reduce erosion rates approximately 1 to 4 percent. Alternative 3B would reduce river fuel barge traffic from 122 to 64 roundtrips, which would reduce erosion rates approximately 1 to 3 percent.

We recommend additional design features and mitigation measures be included in the EIS to minimize shoreline erosion: (1) establish specific barge speed limits on the Kuskokwim River (upstream and downstream), (2) combine different fuel and cargo loads for each barge raft, (3) establish appropriate loads for fuel and/or cargo barges based on water levels and depths to minimize wave energy, and barge grounding.

Barge Grounding

The DEIS evaluates the potential for barges to become grounded in the Kuskokwim River bed during low flow conditions. The Kuskokwim River becomes shallower going further upriver. We have concerns regarding barge stranding on the Kuskokwim River as it would result in increased bed scour, turbidity, wave energy, shoreline erosion, and adversely affect habitat for the fish migration, rearing and spawning. We recommend the EIS include a Barge Grounding and Response Plan for the Kuskokwim River and encourage the project proponent to work with the local communities to establish a monitoring network for potential barge grounding areas during the low water season on the Kuskokwim River.

Maintenance Dredging – Jungjuk Port

The DEIS indicates that maintenance dredging of the Kuskokwim River would be required at the barge landing. We are concerned that maintenance dredging may adversely impact fish spawning areas and incubating eggs in the gravel, as well as alter migration patterns. There is insufficient information in the DEIS regarding the timing, frequency (e.g., annual, winter, summer), location, area, and volume of material to be dredged. We recommend the EIS provide additional details regarding the proposed maintenance dredging on the Kuskokwim River. We also recommend that the EIS analyze the proposed

types of river dredging equipment that would be used (e.g., suction, clam shell, etc.) and evaluate the proposed dredge material disposal site(s) and/or beneficial use of the dredged material. Further, we recommend that the environmental analysis of the EIS include an evaluation of the direct, indirect and cumulative impacts associated with maintenance dredging the Kuskokwim River.

Stream Bank Restoration

As part of the CMP to offset losses to wetlands and aquatic resources under CWA Section 404, we recommend the evaluation of stream bank habitat restoration of the Kuskokwim River and Crooked Creek. Using the baseline bank erosion information attributable to these barge operations, we recommend that the project proponent coordinate with local communities to identify, inventory, and map segments of the river where significant bank erosion has occurred. We recommend that monitoring activities focus on river erosion rates and new areas of erosion and that the EIS and CMP further describe the frequency and methods of monitoring. We recommend that a process be in place to prioritize stream bank restoration projects, as described in the CMP.

PREMATURE MINE CLOSURE

Due to market fluctuations in gold commodity prices, it is appropriate to evaluate a scenario where the Donlin Gold Mine Project may close unexpectedly, either temporarily or permanently, prior to the planned 27.5 years of active mine life. We recommend the EIS evaluate the environmental and social impacts associated with a low probability, high consequence event of a premature mine closure and that the EIS disclose the basis for a premature mine closure (e.g., higher than anticipated operating costs, low production, or low commodity prices).

We recommend that the EIS describe potential scenarios for premature mine closure and implications for the mine site facilities, such as the open pit, WRF, TSF, and the transportation infrastructure, and the pipeline. We recommend the EIS evaluate different scenarios for premature mine closure during different timelines (e.g., 10, 15, and 20 years) of the mine life and post closure and describe the management measures and procedural controls that would be implemented to reduce erosion and manage containment of surface and groundwater contaminants and ensure a sustainable closure. We recommend implementation of a monitoring plan during a temporary and/or permanent mine closure at different timeline scenarios.

Closure Social Impact Assessment

We recommend that the EIS discuss the socioeconomic impacts associate- with a premature mine closure to determine the overall impacts to individuals, communities, and the regional economy. The DEIS indicates that a Closure Social Impact Assessment (CSIA) would be an important component of the proposed project closure plans and would outline measures with potentially affected communities to manage a tapered economic decline. As part of a premature mine closure scenario, we recommend a preliminary CSIA be developed with active and meaningful engagement from the local communities and that the CSIA be included in the EIS. In addition, we recommend that the CSIA be reevaluated at five-year intervals in order to gauge the project benefits and community needs on a more routine basis and make changes to benefit the outcome that would be coincident with project operations. This would also assist the communities in the event of unplanned temporary closure or pre-mature mine closure and/or abandonment.

Financial Assurance

Furthermore, we recommend the EIS discuss how a premature mine closure would affect financial assurance for closure and reclamation and payments to establish the Donlin Gold Trust Fund for long-term monitoring (Appendix A). We recommend disclosure of the FA estimates that would be available during the timeframe of the premature mine closure scenario and whether the FA amount would be sufficient to cover the costs of properly containing, reclaiming, and/or closing the mine facilities. It is our understanding that models have been used to evaluate the financial assurance estimates during different timeframes of the active mine life.

MINE SITE FACILITIES

Mine Pit Dewatering

During mine operations, the dewatering of the open pit mine using groundwater wells would result in a cone of depression that would lower the water table approximately 1,500-ft near the center of the pit over a surface area of 16-mi^2. This cone of depression would result in long-term direct, indirect, and cumulative impacts to surface and subsurface groundwater, including wetlands. Approximately 541 acres of wetlands adjacent to Crooked Creek could be affected by mine pit dewatering.

The DEIS indicates that mine pit dewatering would reduce stream flow in Crooked Creek by 24 to 67 percent in the winter, and 9 to 20 percent in the summer. The DEIS indicates that during winter months, there would be no enhancements to augment stream flow in Crooked Creek. The lack of stream flow would probably lead to serious changes in the character of Crooked Creek, potentially resulting in little to no flow, and the complete freeze up of the creek during the low flow period, which may have serious effects on stream life. We have concerns regarding impacts to fish rearing, migration, and spawning habitat, as well as potential incubating eggs in the gravel beds. We recommend that the EIS consider real time flow monitoring with discharge points above and below the influence of the cone of depression. By monitoring flows above and below the cone of depression, water augmentation could be directed to ensure that low flows of Crooked Creek would be mitigated where it is needed. Augmentation could increase flows through the zone to prevent adverse impacts from low flows in Crooked Creek.

We recommend the EIS evaluate advanced water treatment to treat the groundwater from the mine pit dewatering and to discharge the treated water in Crooked Creek further downstream from the influences of the cone of depression to augment the reduction and elimination of groundwater and surface water. We also recommend that the EIS include a Mine Pit Dewatering Monitoring Plan to ensure that flow reductions to Crooked Creek are being monitored in real time as the pit is being developed, and design features, mitigation measures, and advanced water treatment are appropriate and adequately implemented to minimize impacts.

Pit Lake

At the end of the active mine life, surface and ground waters that would replenish Crooked Creek and adjacent wetlands would be diverted into the open pit mine to create the pit lake. The DEIS indicates that after the pit lake fills with water, a new equilibrium groundwater level would become established. Because the pit lake level would be below the elevation of Crooked Creek, the section of the creek that runs along the pit lake would lose groundwater to the cone of depression created by the pit lake. This could result in long-term wetland and stream flow effects. Groundwater modelling results show that the

pit lake would continue to be a destination for groundwater flow and that Crooked Creek would continue to lose water to the groundwater systems flowing to the pit because of ongoing pumping and treating of the lake water to keep levels below surrounding water levels. We recommend that the long-term impacts to wetlands and Crooked Creek resulting from groundwater migrating toward the pit lake be evaluated in the EIS and that compensatory mitigation be proposed in the CMP and the EIS to offset the indirect impacts and temporal loss of wetlands adjacent to Crooked Creek.

The DEIS suggests that maintaining the pit lake at an elevation 10 meters below the invert level is intended to prevent direct discharge of pit lake water into surface waters (Crooked Creek). Particularly during the winter months and dry periods, groundwater flows out of aquifer storage into Crooked Creek, which constitutes the majority of stream flows. In the worst case scenario, significant groundwater contamination could occur prior to the pit lake start of pumping. The DEIS does not suggest that the pit lake would be maintained as a hydraulic sink. Therefore, discharge from the pit lake via groundwater could occur, resulting in both transport of pit lake contaminants into groundwater, but also in potential leaching and mobilization of contaminants, such as mercury and arsenic, in the surrounding pit wall rock via groundwater, and discharge into surface water via down gradient groundwater discharging into surface water.

We recommend that the EIS discuss the modeling results and the conclusions made regarding groundwater contaminants not migrating away from the pit. The range of hydraulic conductivities (Table 3.6-2) are fairly wide, and indicate that contamination could migrate up to 14-feet per day during the 52-year filling period of the pit lake. Even in the lower aquifer depths, the contaminants could migrate up to 0.2-feet per day. While it is important to assume a uniform conductivity for modelling purposes, using a relatively low geometric mean could potentially underestimate contaminant movement during the pit lake filling period, and potentially during the mine operations period. We recommend additional modelling and analysis of the hydraulic gradient of the pit lake to determine the potential for the transport and migration of contaminants, such as mercury and arsenic, into groundwater discharging into Crooked Creek and adjacent wetlands. In particular, it is important to evaluate the rate and area of groundwater migration during the period when the pit lake is filling. A greater pumping and advanced water treatment rate may be necessary prior to discharging into Crooked Creek. We recommend using a worst-case and projected hydraulic conductivities multiple times during post-closure to determine the maximum contamination of the bedrock aquifers so that mitigation measures can be proposed and implemented in case of groundwater contamination.

We recommend a Pit Lake Groundwater Sampling and Monitoring Plan be developed to focus on long-term water quality monitoring, sampling, and testing of the groundwater around the pit for the presence, abundance, and migration of contaminants, such as mercury and arsenic. We recommend that groundwater monitoring be done in real-time with the best available technology. We also recommend that monitoring continue until the model is confirmed that the water is flowing back toward the pit and no further contamination is present in groundwater. If groundwater contamination is found to be migrating away from the pit, we recommend that mitigation measures are implemented to remediate the contaminated groundwater as soon as possible to prevent the spread of contamination. Advanced water treatment of groundwater may be required to ensure that surface water meets water quality standards.

Waste Rock Facility

The DEIS includes information indicating that the groundwater from the WRF is predicted to exceed AWQS, potentially impacting groundwater quality. We recommend lining the WRF and other mine facilities, such as the contact water ponds, which have the potential to contaminate groundwater. In addition, we recommend that the FEIS include a groundwater quality monitoring plan to detect any potential contamination resulting from leachates generated from the WRF and leachates be mitigated and contained.

Tailings Storage Facility and Dam

The TSF and dam have the potential to contribute to environmental and public health concerns if not properly constructed, maintained, and monitored. For example, a catastrophic event at the Mount Polley Mine in central British Columbia resulted in the breach of the mine tailings impoundment causing a release of tailings slurry/saturated tailings into the downslope waterbodies.

Any proposal for a subaqueous tailings storage facility requires a hard look and justification. We appreciate that a Failure Modes and Effects Analysis (FMEA) was developed during the DEIS process. We recommend that the FMEA be included in the EIS and that an adaptive management plan resulting from the FMEA process be included to address contingencies relative to not only tailings dam stability concerns, but other environmental concerns. We recommend that the FMEA process continue to be used by the project proponent and State and Federal regulators to inform the engineering design and mitigation processes as the project continues through the active mine life and post-closure.

We recommend that a Wildlife Management Plan be developed and implemented to prevent birds and/or wildlife from access to the TSF and the pit lake to prevent potential exposure of birds and wildlife to contaminants. Wildlife protection measures could include incorporating an enclosed perimeter fence, netting or other non-intrusive barriers. Hazing may also be considered a wildlife management control technique.

CHEMICALS OF CONCERN

Methyl Mercury

The DEIS indicates that naturally elevated mercury levels are found sporadically in surface and groundwater and sediments within and surrounding the proposed mine site. Concentrations of mercury in surface and groundwater samples collected from both within and outside of the proposed mine site exceeded the applicable water quality standard. The more harmful form of mercury, methylmercury, is also present in existing sediments. The proposed mining operations could increase methylmercury production and concentrations due to increases in sulfate loading, organic carbon loading, and inorganic mercury loading in area surface waters, including wetlands. Sources of inorganic mercury would be from fugitive dust and stack emissions. We recommend that the EIS discuss the dynamics of mercury (e.g., sources, movement, distribution, transformation, bioaccumulation, etc.) in wetlands, rivers and stream systems, where methylation would be expected to occur mostly in the sediments.

The DEIS does not provide information on baseline measurements of methylmercury in water or any of the key constituents associated with methylmercury production, such as sulfate and organic carbon. Without this baseline information, the environmental and human health impacts from mining activities may be difficult to identify. The model used to estimate baseline methylmercury concentrations in water is driven by unrealistically high organic carbon concentrations, and likely over estimates the current

baseline methylmercury concentrations in water. As a result, any measured increases in stream methylmercury concentrations due to mine activity may not be apparent.

Methylmercury is more readily retained by higher trophic-level organisms than other forms of mercury. We have concerns with the potential bioaccumulation of methylmercury in the food chain, particular in regards to traditional subsistence foods. The accumulation of methylmercury in higher trophic level organisms results mainly from the ingestion of methylmercury-containing food rather than direct uptake of methylmercury from drinking water. We recommend that the EIS include additional modelling of mercury bioaccumulation, sources and pathways for uptake and exposure to methylmercury in the food web. In addition, we recommend long-term monitoring of the human health impacts, food consumption and exposure to methylmercury throughout the active mine life and during post-closure. In addition, we recommend developing the plan in coordination and involvement with the local native communities.

Arsenic

The DEIS identifies elevated naturally occurring baseline concentrations of arsenic in soils, sediments and surface waters in the vicinity of the proposed mine site, which is common for gold-bearing areas. Concentrations of arsenic in surface and groundwater samples collected from both within and outside of the proposed mine site exceeded the applicable water quality standard. We recommend that the EIS identify the sources of arsenic from mine operations and discuss how those sources may potentially increase existing baseline arsenic concentrations during the active mine life and post-closure. We recommend that the EIS provide a comparison of baseline arsenic concentration levels in soils, sediments, surface water and groundwater to other mineralized and non-mineralized areas of Alaska.

We recommend developing and implementing an Arsenic Management and Monitoring Plan to ensure that the project does not exacerbate standards exceedances for arsenic in surface and groundwater, and ensure acceptable human health exposure limits during project construction, mine processing operations, mine pit dewatering, pit lake recharging, and prior to discharging into surface waters, such as Crooked Creek. We also recommend the EIS identify the specific water treatment processes to remove arsenic from surface and ground waters on the mine site.

Acid Rock Drainage/Metal Leaching

Geochemical characterization at the mine site was conducted to determine the extent of acid rock drainage/metal leaching (ARD/ML). We have concerns regarding the WRF and potential for ARD/ML during the operations phase, and prior to placement of a final cap. If the non-acid generating (NAG) and potentially acid generating (PAG) waste rock are not be adequately mixed during placement in the WRF, then it may begin to produce higher-concentrations of acidic seepage by the end of the mine life for year 26. We recommend that a liner be incorporated into the design of the WRF to minimize migration of contaminants into groundwater. We also recommend monitoring the WRF to ensure no ARD/ML migrates into groundwater.

Water quality predictions indicate arsenic has the potential to be leached from waste rock under both acidic and non-acidic conditions. According to the DEIS, arsenic leaching is a potentially significant concern for almost all waste rock due to widespread elevated concentrations in the rock and its high leachability, as indicated by the samples analyzed. We recommend that the EIS clarify that the purpose of performing waste rock geochemical characterization is to manage potential ARD/ML, and the importance of water treatment, including advanced water treatment of arsenic. We recommend a plan to address ARD/ML from the WRF and to include additional monitoring and testing of the groundwater for potential leaching of contaminants.

We recommend that the EIS include geochemical characterization of potential new and existing gravel material source sites that would be used to construct the mine access road from the Jungjuk Port, air strips, access roads for pipeline construction and facility gravel pads. This characterization is needed to determine the volume of PAG rock material and to identify specific design features, mitigation measures, and BMP to minimize potential ARD/ML to adjacent surface waters, including wetlands. If the gravel source material is found to consist of PAG material and/or have elevated mercury and arsenic concentrations, then the fill material may be considered unsuitable fill material under the CWA Section 404(b)(1) guidelines requirements and not suitable for discharge into wetlands and other surface waters.

FUGITIVE DUST

Fugitive dust emissions may be caused by vehicle travel on the gravel access roads, and other unpaved areas, as well as activities at the mine site, such as blasting, crushing and grinding of the ore rock, and stack emissions. According to the DEIS, fugitive dust could be measurable as far as ten miles from the mine site, one tenth of a mile from gravel roads. The DEIS includes evaluation of fugitive dust from the mine site and transportation facilities, but no evaluation of fugitive dust associated with pipeline construction, such as the gravel access roads, pipeline trenching and burial, and gravel source sites. We recommend the EIS include analysis of fugitive dust emissions from the construction and operations of the natural gas pipeline.

Fugitive dust has the potential to deposit and collect on vegetation, wetlands, and other surfaces. Soils with the highest organic content have been shown to exhibit the greatest potential for metal accumulation. We recommend that the EIS discuss the potential exposure to contaminants resulting from fugitive dust emissions and evaluate potential pathways for bioaccumulation. In addition, we recommend the EIS evaluate the potential for biotic transfer from dust-affected soils and vegetation to humans and wildlife.

The DEIS indicates that unpaved gravel roads are assumed to be controlled at 90 percent, primarily with periodic chemical application and watering. However, if the gravel source material is tested to contain of high volumes of PAG, then watering to reduce fugitive dust emissions may not be an acceptable management practice as it could result in the generation of ARD/ML to adjacent wetlands, surface and ground waters. We recommend the EIS evaluate other options for minimizing fugitive dust from gravel roads and pads, such as capping the surface of gravel roads and pads with an inert material or applying a non-toxic chemical treatment.

As part of Red Dog Mine operations near Kivalina, Alaska, a Fugitive Dust Management, Testing, and Monitoring Plan has been developed and implemented to evaluate fugitive dust emissions and their impacts. We recommend that a similar plan be developed for the Donlin Gold Project to evaluate fugitive dust emissions and their distribution to soils, air, water, vegetation, and the potential exposure of contaminants, such as mercury, arsenic, ARD/ML, to humans and wildlife. The objectives of the study would be to: compile and summarize information pertinent to the fugitive dust issue, present a preliminary conceptual site model describing sources and transport mechanisms for fugitive dust, potential exposure pathways, and human and ecological receptors; identify where additional data collection is needed (data gaps); and outline a decision-making framework for addressing future fugitive dust issues. We also recommend that the HIA determine acceptable exposure concentrations and limits, and pathways for humans and wildlife to bioaccumulate contaminants from ingesting foods exposed to fugitive dust. We recommend developing a Fugitive Dust Control Plan for the EIS to include design

features, mitigation measures, and monitoring of fugitive dust emissions and exposure during the active mine life and post closure.

Spill Scenarios and Response Planning

The DEIS includes an evaluation of potential spill risks for low probability and high consequence events associated with hazardous substances such as fuel (diesel) transported in ocean and river barges, trucks, and pipelines, and stored in tanks. In addition, the DEIS evaluates releases of LNG, cyanide, and mercury to the environment during transportation on the mine access road. Based on the FMEA, the DEIS considered release of mine tailings associated with a partial breach of the TSF dam and the downslope failure and rupture of the liner.

Spill Frequency and Volume

According to the DEIS, spill frequency and volumes are qualitative assessments based on the rate or frequency of occurrence, which includes factors, such as operating procedures, personnel training and awareness, maintenance, and human error. We recommend that the spill frequencies and volumes evaluated in the DEIS be based on real spill incidents that have occurred at active mine sites and/or other industrial facilities in Alaska, the United States, and abroad. In addition, we recommend discussing the frequency and volume of reported spills at regulated facilities in Alaska in the EIS. For example, in May 2010, a cyanide water spill of over 300,000 gallons occurred at the Fort Knox Mine due to a failure in the automated process control system. We recommend using this example of a real spill scenario in the spill risk analysis for cyanide. In addition, we recommend that the EIS include actual spill frequencies and volumes associated with incidents from ocean vessels, river barges, tank farms, and tank trucks, and other mining and industrial facilities. The Alaska Department of Environmental Conservation (ADEC), Division of Spill Prevention and Response maintains a database of reported spills and spills at regulated facilities. ADEC issues an annual summary of oil and hazardous spills for Alaska.

Spill Response and Planning

In southwest Alaska, there are no industrial operations at the scale of the proposed Donlin gold Project. We have concerns that the area is remote and no infrastructure exists and the capacity for responding to spilled substances is very limited. Due to Federal and State regulations, statewide capacity for oil spill response is well established. However, there are no similar spill response requirements for the response of spills for LNG, cyanide, mercury, and mine tailings. Due to the gaps in response capacity, we recommend that the EIS include a commitment for the project proponent to work with the local communities to develop regional response capabilities and response plans for accidental releases and spills of LNG, cyanide, mercury, and mine tailings. We recommend the spill response planning include: training local responders, engaging in community response exercises, prevention, and monitoring. In addition, we recommend identifying the location and type of pre-deployed response and clean up equipment in the EIS.

Wetlands and Aquatic Resources

The DEIS includes environmental analysis that can be used to support the U.S. Army Corps of Engineers' CWA Section 404 and Rivers and Harbor Act Section 10 permit decisions. We recommend the EIS address compliance with the CWA Section 404(b)(1) Guidelines and the Corps public interest review. As written, the analysis in the DEIS creates a fundamental disconnect between the NEPA and the 404 permitting processes. The DEIS indicates that the wetland information may be inadequate to meet the Corps' permit review needs and would be revised later for the EIS or the permitting process.

Preliminary Jurisdictional Determination

The EPA raises concerns regarding the wetland preliminary jurisdictional determination (PJD) for the Donlin Gold Project, which has not been approved at this stage of the environmental review process. The DEIS indicates that the wetland mapping process may have over-estimated the actual project wetland impacts and would be revised during the Corps' permit process to eliminate potential jurisdictional inconsistencies, and to determine adjusted areas of jurisdictional wetland impacts following recent jurisdictional guidelines. We recommend correcting the jurisdictional inconsistencies and including the revised estimates of the wetland acreage impacts in the EIS. Accurate information regarding the acreage of direct and indirect wetland impacts associated with the alternatives is necessary to adequately compare alternatives in the EIS. We recommend the EIS disclose the systematic process for reevaluating the jurisdictional wetland impacts, such as additional ground-truthing and mapping that may be required to verify the wetland/upland mosaics.

Functional Assessment

The DEIS indicates that the functions of wetlands within the study areas were preliminarily assessed using a variation of the Hydrogeomorphic (HGM) rapid functional assessment method. Functional capacity indices (FCIs) for rating the functional performance and value for each of the five HGM classes were evaluated. The variables, assumptions, and calculations used to develop FCIs for each function and HGM class were described in the Donlin Gold Wetland Functional Assessment Report. As indicated in our previous comments on the Report, the EPA generally supports use of the modified HGM functional assessment method for evaluating HGM wetland classes and functions, and use of the FCIs for rating the functional performance and value for each wetland class in the study areas. We recommend that the FCIs be adopted to evaluate debits and credits for compensatory mitigation for the Donlin Gold Project.

The DEIS notes that the Corps plans to complete a functional assessment for the proposed project at or after the EIS stage or the NEPA process. Our understanding is that the Corps' functional assessment would be based on the *Cowardin et al* classification system. We recommend that the EIS disclose to the public the basis and rationale for the Corps not accepting the modified HGM functional assessment method for the Donlin Gold Project. We recommend that the Corps' functional assessment approach include not only wetlands, but the functions of other types of waters that fall under Corps' jurisdiction, such as river channels and stream systems, lakes and ponds. In addition, we recommend that the Corps' functional assessment methodology include a debit and credit evaluation process to determine the options for wetlands, streams, and aquatic resources compensatory mitigation. We recommend incorporating the Corps' functional assessment method, and the revised wetlands and aquatic resources information into the EIS. This revised information is important to evaluate the LEDPA under the CWA Section 404(b)(1) Guidelines.

We would appreciate being involved in the development and/or review of the Corps' functional assessment methodology. The EPA requests a meeting to discuss the Corps' approach to the development of the functional assessment methodology, which may be applied to other projects in the future.

Compensatory Mitigation

In 2008, the Corps and the EPA jointly issued a new rule on *Compensatory Mitigation for Losses of Aquatic Resources* (Mitigation Rule). The mitigation rule establishes performance standards and criteria

for the use of mitigation banks, in-lieu fee mitigation programs, and permittee-responsible mitigation (e.g., restoration, enhancement, establishment, and preservation) to improve the quality and success of compensatory mitigation projects. We recommend that the EIS disclose how the Corps plans to evaluate the requirements of the mitigation rule and the compensatory mitigation for the Donlin Gold Project.

EPA notes the inclusion of the Conceptual Compensatory Mitigation Plan (CMP) in the DEIS (Appendix M). We have concerns that the mitigation banks and In-Lieu Fee programs proposed in the DEIS and the CMP either have not been approved by the Corps and/or are not currently active. We recommend that evaluation of additional compensatory mitigation options be included in the CMP and the EIS. We recommend the CMP take a watershed approach to evaluating the temporal loss of wetlands and aquatic resource functions and values, and demonstrate that all direct, indirect, and cumulative impacts to wetlands and aquatic resources functions and values have been adequately replaced. Temporal losses would need to consider that newly restored wetlands would not have similar functional capacity as the original pre-disturbed wetlands for decades.

At this time, Permittee Responsible Mitigation (PRM) may be a viable option for compensatory mitigation. We recommend that PRM plans and activities in the CMP focus on the following: (1) restoration of previously existing wetlands or waters; (2) enhancing or improving functions of existing wetlands or waters; (3) creation of new wetlands or waters; and (4) preservation of existing wetlands or waters. We recommend that the CMP discuss how PRM would be monitored to ensure project success in meeting certain performance standards, and to address any restoration problems through corrective actions. Additional PRM options include evaluation of river bank enhancement and restoration projects for the Kuskokwim River, Crooked Creek, and other impacted surface waterbodies within the project watersheds. We recommend fully restoring mine site facilities, such as the contact water ponds, diversion ditches, ore stockpile berms to functional wetlands and aquatic resources.

A mitigation bank is another viable option to provide compensatory mitigation to offset impacts to wetlands and aquatic resources. We recommend the project proponent develop its own mitigation bank for the Donlin Gold Project. This could be accomplished by developing a mitigation banking prospectus and instrument for an entity to purchase wetland property for preservation and/or restoring, enhancing, and/or creating additional wetlands in the impacted watershed areas. We recommend the mitigation bank include a functional assessment method to determine the level of credits available to offset the project impact debits.

If the CMP is determined not to be acceptable in the Corps' Record of Decision, then we recommend the Corps use their bonding authority as described in Regulatory Guidance Letter (RGL) 05-1. This RGL supports the use of financial assurance and includes suggested language for special permit conditions to establish a funding mechanism to provide compensatory mitigation to offset wetland impacts during the project lifecycle. We recommend the Corps establish a bonding and financial assurance instrument for compensatory mitigation prior to permit issuance. We suggest the EIS clarify whether the Alaska State Implementation Review Team (SIRT) will be responsible for overseeing the bonding instrument and ensuring that compensatory mitigation for the Donlin Gold Project is being implemented.

Corps' Public Notice for the EIS

The current information and analysis in the DEIS is not adequate to fully evaluate the potential adverse impacts to wetlands and aquatic resources under the CWA §404(b)(1) guidelines. In addition, the conceptual compensatory mitigation plan is not adequate since the wetlands jurisdictional determination has not been approved.

The Corps' proposed changes to the wetlands functional assessment methodology and estimates of wetland impacts evaluated in the DEIS would result in the development of substantively new information and analysis in EIS in Chapter 3.11 (Wetlands). It is our understanding that a supplemental, revised, and/or corrected public notice will be issued if changes in the application data would affect the public's review of the proposed action (see 33 CFR 325.2, 325.3). Furthermore, potential project modifications after public review and comment of the DEIS may require the project proponent to submit a revised Section 10 Rivers and Harbors Act/Section 404 Clean Water Act application to the Corps at the EIS stage.

For actions subject to NEPA, where the Corps is the permitting agency, the analysis of alternatives required for NEPA documents, including supplemental Corps NEPA documents, *will in most cases* provide the information for evaluating alternatives under the 404(b)(1) Guidelines. *On occasion*, however these NEPA documents may not have considered the alternatives in sufficient detail to respond to the requirements of the Guidelines. In the latter case, it may be necessary to supplement the NEPA documents with this additional information [40 CFR 230.10(a)(4)].

In sum, the current information and analysis in the DEIS is insufficient to fully evaluate adverse impacts to wetlands and aquatic resources under the CWA §404(b)(1) guidelines. We therefore recommend that the Corps provide complete and accurate information when it is available, and release the revised analysis for public review and comment. In addition, we encourage the Corps to withdraw the current Department of Army Public Notice (PN) issued with the DEIS and issue a supplemental, revised, or corrected PN for review comment and make sure that the new information is captured in the EIS. Doing so will provide the public with an opportunity to review and comment on the new information and analysis, and potential project changes prior to the issuance of a Record of Decision and the CWA §404 permit.

CLIMATE CHANGE AND GHG EMISSIONS

The EPA notes that the DEIS has disclosed projected quantitative estimates of GHG emissions (as CO_2-equivalent) for the construction, operations, maintenance, and closure phases of the mine site; the construction, operations, and maintenance for the transportation facilities (on land, air and river); and the construction, operations and maintenance phases for the pipeline. Chapters 3.8 (Air Quality) and 3.26 (Climate Change) provide a summary of the quantitative estimates of GHG emissions for Alterative 2, the proposed action. We recommend that the EIS include a description of the tools, methodology, models, and scientific research information used to quantify these emissions.

Throughout the Climate Change section (3.26), the DEIS compares total expected project level GHG emissions with estimated Alaska, U.S. and global GHG emissions. The DEIS also compares the expected project level GHG emissions with major industrial sectors in Alaska. We recommend that the EIS not include the broader comparisons. These comparisons obscure rather than explain how to

consider GHG emissions under NEPA. Climate change is a global problem resulting from the emissions of many individual sources whose impacts are cumulative. The environmental impacts are best described by using emissions as a proxy to compare the proposal, alternatives and potential mitigation.

Scope of Analysis

The DEIS includes quantitative GHG emissions for the proposed action but does not include quantitative estimates of GHG emissions for the alternatives (3A, 3B, 4, 5A, and 6A). We recommend that the EIS quantify the direct and indirect GHG emissions for the action alternatives and for each phase of development (e.g., construction, operations, maintenance, closure and reclamation). Also, we recommend that the Comparison of Impacts by Alternatives (Table 3.8-33) summarize the GHG emissions for the proposed action and each alternative. We recommend that the EIS include a detailed inventory of the direct and indirect, emissions of each individual contributing source (e.g., mobile, stationary and fugitive) and the respective quantitative emissions from each project phase.

We recommend that the scope of analysis for the climate change impacts of the proposed action include all emissions sources (fugitive, mobile, and stationary) from river barges and ocean vessels, air and land transportation, heavy equipment, and aboveground facilities that support the construction, operations and maintenance, and closure and reclamation of the Donlin Gold Project (mine site, transportation facilities, and pipeline). In particular, we recommend that the EIS include the GHG emissions from air and ocean barge transportation of fuel and cargo from the lower 48 United States (Seattle, Washington) and Canada (Vancouver, British Columbia) to the mine site. The proposed expansion of the fuel storage and marine ports at Bethel and Dutch Harbor are considered connected actions in the DEIS. We recommend that the EIS include an analysis of GHG emissions from these connected actions. We also recommend that the analysis include the GHG emissions associated with the final purification of the gold doré bars and transportation to the refinery.

Carbon Sources and Storage

The CEQ revised draft guidance definition of "emissions" includes releases of stored GHGs as a result of destruction of natural GHG sinks such as forests and coastal wetlands, as well as future sequestration capability. The biological resources in the project area may represent substantive storage, and/or sinks (sequestration) for GHGs. When biogenic resources are disturbed during project construction and/or operations and maintenance, these carbon storage or sink areas become sources of carbon emissions. Whereas, during closure at the end of mine life, reclamation of disturbed aboveground facilities may result in the conversion of a carbon source to carbon storage or sinks. We recommend that the EIS quantitatively and qualitatively evaluate the carbon storage and sequestration capacity of the biogenic resources for the No Action Alternative. This information would serve as a baseline to compare the carbon storage and sequestration capacity of the No Action Alternative against the proposed action and the action alternatives.

For example, the DEIS indicates that as permafrost soils warm, organic carbon reservoirs trapped in the ice are mobilized, causing carbon dioxide and methane to be released into the atmosphere. The total amount of permafrost soils along the pipeline that are predicted to thaw during operations and closure is 37 million tons with an additional 9 million tons of permafrost soil predicted to thaw during operations and closure (Page 3.26-43). For the proposed action and action alternatives, we recommend that permafrost soils and other biogenic resources, such as vegetation, wetlands and aquatic resources be

quantitatively and qualitatively evaluated for the potential GHG emissions (CO_2-equivalent/acre) during project construction, and operations and maintenance.

Emissions from Spill Scenarios

Chapter 3.24 (Spill Risk) evaluates the impacts associated with low probability, high consequence spill scenarios with an ocean barge rupture at sea, river barge release, tank farm release, tanker truck release, diesel pipeline release, LNG release, cyanide release, mercury release, and a partial tailings dam failure. We recommend that the spill scenarios be qualitatively and quantitatively evaluated in the EIS as they may represent a potential contribution to GHG emissions and climate change impacts, particularly spills of diesel fuel from barges, tank farms, trucks, and pipelines.

Consider Using Emissions Targets

The ability to meaningfully articulate emission reductions would be a valuable component of a mitigation package. One approach we suggest is that the EIS identify reasonable GHG emission reduction targets or goals for some or all project components (e.g., mine, transportation facility, and pipeline) and development phases (e.g., construction, operations, maintenance, closure and reclamation). As the project progresses, periodic reports could show progress toward reaching the targets.

Mitigation Measures

Chapter 5 (Impact Avoidance, Minimization, and Mitigation) includes design features (Table 5.2-1), mitigation measures (Table 5.5-1), and monitoring and adaptive management plans (Table 5.7-1) to mitigate impacts associated with the project. We recommend that the EIS further identify and describe measures for reducing and mitigating GHG emissions and climate change effects such as evaluating enhanced energy efficiency, lower GHG technology, and renewable energy. We recommend that the EIS disclose GHG reductions associated with such measures. EPA further recommends that the Record of Decision commit to implementation of reasonable mitigation measures that would reduce project-related GHG emissions.

Reducing Emissions

The DEIS evaluates action alternatives that have the potential to minimize impacts to the environment. Alternative 3A (LNG Powered Haul Trucks) was carried forward for analysis because it would reduce the frequency of diesel fuel barging on the Kuskokwim River. This alternative may serve to reduce overall project GHG emissions and climate change impacts.

Alternative 3A evaluates the use of natural gas powered trucks (+300-ton payload) that would move waste rock and ore from the open pits. These large trucks account for 75 percent of the total project diesel consumption. The conversion to natural gas powered trucks would reduce the diesel fuel consumption and increase natural gas usage by 28 percent. The reduction of diesel fuel required for operations could potentially reduce river barge traffic by 32 percent. Furthermore, truck traffic on the gravel road would be reduced by 75 percent, which would also result in a reduction of fugitive dust emissions. Alternative 3A could potentially reduce GHG emissions associated with river barges, trucks and fugitive sources. The DEIS indicates that Alternative 3A would not include using LNG for the trucks hauling cargo and fuel on the mine access road from Jungjuk Port. We recommend that Alternative 3A include the use of LNG for all vehicles and trucks and that the EIS disclose the

quantitative estimates of GHG emissions associated with Alternative 3A. We recommend incorporating Alternative 3A into the proposed action as a measure for reducing overall project GHG emissions.

Reclamation and revegetation of certain disturbed areas, such as the waste rock facility and the tailings storage facility could reduce the overall project climate change impacts and result in the conversion of a carbon emission source to carbon storage or sink. We recommend that the EIS qualitatively and quantitatively evaluate mitigating climate change impacts through the reclamation and revegetation of disturbed areas, including wetland enhancement or restoration, and potential conversions from carbon source to carbon sink.

In July 2015, the EPA launched the Natural Gas STAR Methane Challenge. This is a new voluntary program for reducing methane emissions. Methane, the primary component of natural gas, is a potent greenhouse gas with a global warming impact 25 times that of carbon dioxide. Companies who sign up for the program agree to make commitments for methane emission reductions, with accountability and transparency in progress in achieving those commitments, and with the potential for public recognition for leadership in reducing GHG emissions in the United States.

Climate Change Resilience

We recommend the Corps consider modifications to the design of the proposal to incorporate resilience to foreseeable climate change. For example, the DEIS states that permafrost is predicted to thaw within the project area. Permafrost stability or anticipated changes to existing permafrost conditions can affect settlement and ground stability characteristics that would in turn significantly influence design and construction of project components such as facilities and infrastructure.

WATER SOURCES AND VOLUMES

The Donlin Gold Project would require substantial volumes of water for the construction of permanent and temporary gravel facility pads, gravel and ice roads, hydrostatic testing of the pipeline, and other mine related activities. We recommend that the EIS evaluate the project water resource requirements for all of the action alternatives, not just the Proposed Action.

We recommend that the EIS evaluate the year round water use resources, locations, and volumes. For each type of water resource (river, stream, lake, pond – permanent, intermittent, ephemeral, perennial), we recommend including a description in a table of the maximum and minimum surface area, depths and width of the water resource, available water volumes, volume of proposed withdrawal, winter and/or summer withdrawal, presence/absence of resident and/or anadromous fish species. Further, we recommend describing measures, such as screening, that would be implement to minimize impacts to fish. We recommend including the following additional mitigation measures: establishing water withdrawal rates, timing of water withdrawal to avoid fish migration, spawning, and incubating eggs. The location of water resources should be included on a map and/or aerial photograph. This additional information is need to adequately evaluate the direct, indirect and cumulative impacts to the aquatic resources and should not be deferred until the permitting process.

FINANCIAL ASSURANCE

The DEIS provides disclosure of the financial assurance (FA) cost estimates associated with implementing the reclamation and closure plan and long-term monitoring (Appendix A). In addition, the

FA includes the costs associated with the removal, abandonment, and reclamation of the natural gas pipeline. The Standardized Reclamation Cost Estimator (SRCE) model was used to calculate the FA costs for mine closure. The FA assumes partial backfilling of the open pit and modification of tailings operations at the end of the mine life. We recommend the EIS disclose whether premature closing of the mine was considers as a possible scenario in addition to a reasonable maximum cost scenario.

CUMULATIVE EFFECTS

We recommend that the cumulative effects spatial analysis area (Figure 4.2-1) be expanded to include the ocean vessel traffic route and potential direct, indirect, and cumulative impacts from the lower 48 United States (Seattle, WA) and Canada (Vancouver, BC) to/through Dutch Harbor and Bethel, as mentioned in Table 4.2-1. We recommend the analysis area also include the transportation of the gold doré bars for final refinement, which is a reasonably foreseeable future action. Since pipeline supplies would be brought in through Port MacKenzie and/or the Anchorage Port in upper Cook Inlet, the direct, indirect, and cumulative impacts associated with these facilities and activities should be evaluated in the EIS.

Health Impacts

Since the HIA was not included in the DEIS for public review, we are not certain how cumulative effects have been evaluated for human health. We recommend that the cumulative effects of multiple sources, pathways, and exposures from past, present and reasonably foreseeable future actions, including mine operations and accidental chemical spills, to humans be evaluated in the EIS. We recommend conducting a risk based assessment to evaluate all potential sources, pathways, and routes of human exposure to contaminants from air, water, and subsistence foods. We recommend that the EIS describe the acceptable limits for contaminant exposure to subsistence foods and water. In addition, we recommend conducting biological monitoring of human health to evaluate the cumulative impacts during the active mine life and post closure.

GHG Emissions

The DEIS (Table 4.201) describes the past, present, and reasonably foreseeable future actions considered in the cumulative effects analysis. We recommend that the estimates of GHG emissions for these past, present, and reasonably foreseeable future actions be quantified and disclosed in the EIS, to the reasonable extent possible. This information is necessary to understand the cumulative effects of climate change impacts in the region and the contributions for GHG emissions from the Donlin Gold Project.

ENVIRONMENTAL JUSTICE

Demographics

The demographic profiles are in line with Executive Order 12898 and the CEQ guidance. These are foundational Environmental Justice (EJ) documents, but do not represent all of the possible guidance and methodology available. We recommend identifying and referencing other EJ in the EIS.

The DEIS makes use of and cites references to other EJ guidances, laws and recommended best practices that are relevant to EJ analysis and implementation, such as Children's Environmental Health, Sacred Sites, Tribal Consultation, best public engagement practices for EJ and Permitting and EJ and

NEPA; and other guidances and best practices from other agencies and academic sources. For example, ADEC received an EPA grant to develop a tribal protocol for APDES permitting.

The analysis suggests, for Alternative 1 (No Action), that there is an EJ concern based on the economic impact of discontinuing Donlin Mine work thus far. An EJ determination is based on more than just a single factor—in this case economics. If other factors are considered, they might suggest that the costs of Alternative 1 (No Action) - not going forward with the mine - would not result in environmental justice concerns but actually provide and/or maintain existing overall benefits to the communities. Further, from an environmental justice perspective, the development that results in projected benefits of the kind advanced is *sustainable, community driven development.* We recommend the analysis explain how the project fits the description of and meets commonly understood principles of sustainable, community driven development. In the absence of a description, the position that Alternative 1 would pose an environmental justice related impact of any kind is untenable.

The section on socio-economics characterizes the socio-economic impacts of Alternative 1 to the Yukon Kuskokwim region as "minor" and to regions outside that area as "negligible." We recommend cross walking the sections to minimize inconsistencies and avoid contradictory conclusions. Also, provide an economic analysis that confirms disproportionate economic impact of Alternative 1 (No Action). For example, include an analysis of disposable income and categories of spending in community—how much to subsistence support—which is claimed as a benefit in the document-- and the impact on subsistence harvest; the ability of the community to replace or substitute cash economy with other forms of economic activity to cover needs (i.e. level of economic, social and cultural resilience in community).

Vulnerability and Health Impacts

The EIS makes available in the analysis a discussion of factors that make segments of the population vulnerable or sensitive to a variety of impacts such as children, elderly, those with compromised immune systems, and those along the unique exposure pathways such as those engaged in subsistence activities and exposures to workers. We recommend referencing the Health Impact Assessment in the EIS. We recommend that the EIS include research and analysis that illustrates understanding of the health impacts of stress, diminishment or loss of cultural resources.

Cumulative Impacts

The DEIS makes the assumption that a cash based economy is preferable and that it can be compatible with a subsistence and other forms of economic activity. We recommend that the EIS provide a focus of cumulative impact analysis around transitioning a community from a subsistence economy to a cash economy. There is both research and experience to be able to assess the costs and benefits and over all impacts for people making this kind of a transition directed from a place other than their own direct agency. We recommend evaluating the health impacts of transitioning entire traditional communities from a subsistence economy to a cash based economy.

Tribal and public engagement

Tribal and public engagement does not stop with, or is limited to the submission of comments and the one-way transmission of information from any one source to passive audiences. Tribal and public engagement also includes applying the lived and dynamic experiences of people—creating new knowledge and deepening the empowerment of community members-- over the course of time. The end goal of meaningful public involvement, from an environmental justice perspective, is community

empowerment. The sense of individual and community agency and empowerment is a social determinant of health. This is consistent with the definition of health ascribed to in the document. We recommend the project aims to strengthen the social determinants of health while accounting for any erosion of them. We also recommend that there be more proactive and collaborative interactions with the communities in areas such as monitoring, creating and sharing data over the course of the active and closed periods ("in perpetuity") of the mine, and the ability to meet the demands of changing conditions with communities as partners.

Mitigation

There are many opportunities for empowering communities. We recommend involving communities in designing and implementing mitigation measures, strategies, and plans. We also recommend involving communities with monitoring of the mitigation to ensure success in reducing project impacts. We recommend that the mitigation strategies and plans include building community capacity and specify the actions taken and to be taken during the project.

MITIGATION, MONITORING, AND ADAPTIVE MANAGEMENT

The DEIS does not clarify the mitigation measures that would address NEPA and CWA Section 404 permitting requirements. We recommend that the EIS include additional discussion regarding how the proposed mitigation design features under the NEPA requirements will be monitored, tracked, and reported by the project proponent. We recommend a commitment be made in the EIS that a Mitigation Implementation Plan would be developed for the proposed design features, mitigation measures, and BMPs during project construction, operations and maintenance, and closure. We encourage the project proponent to actively engage the local communities in conducting the monitoring activities. We recommend the EIS include a commitment to develop an Annual Mitigation Report that would be presented to the tribes, the public and the agencies for review. We recommend the Mitigation Report tracks and summarizes the successes and problems with each type of mitigation, and includes recommendations for additional design features, mitigation measures, and BMP, as appropriate, to address future project needs and requirements. In addition, we recommend the Mitigation Report outline an adaptive management approach where successful mitigation measures would no longer require monitoring, and that monitoring efforts would shift to those design features, mitigation measures, and BMPs to achieving success.